A Tale of Two Syllabi
Program-integrated information literacy instruction in chemistry and journalism

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Mount Royal College has a longstanding commitment to information literacy as part of its mandate to promote student success and satisfaction. The library has provided course-integrated instruction in a variety of formats for over twenty years. Moving beyond course integration to program integration was a natural progression. Librarians and teaching faculty saw a need to plan sequenced sessions that would introduce students to incrementally complex information skills and resources throughout their academic careers. The librarians anticipated that integrating the instruction through the program would reduce unnecessary repetition, enhance student awareness of the myriad resources beyond the catalogue and databases, and develop students' skills in concert with the increasing demands of their assignments. The process of developing, implementing, and maintaining program-integrated information literacy plans for two of these departments, chemistry and journalism, provides the focus for this case study. To avoid confusion between the academic programs and the information literacy programs, the term 'syllabus' will be used to denote the content and sequence of program-integrated information literacy sessions.

Setting

Mount Royal College is an undergraduate institution offering diplomas, applied degrees, university transfer programs and brokered bachelors degrees to some 13,000 students. In the 2004/2005 academic year, library personnel delivered information literacy (IL) instruction in more than 650 classes in all disciplines at the College.

Information literacy instruction at Mount Royal incorporates several success factors noted in the literature[1,2]. Our focus on course-integrated instruction ensures that each IL session is tailored to the individual needs of particular courses and assignments. Most sessions for first-year students follow a pattern of demonstration and assisted practice to incorporate scaffolding [3] supporting learners as they develop new skills. Sessions for more senior students incorporate more exploration to encourage students to apply what they already know to new resources and research methods. This makes use of the 'curiosity gap' principle, developed by Loewenstein[4] and applied to IL instruction by Borowske[5]. Under this principle the learner is engaged through striking the right balance between boredom and panic; material must be new enough to stimulate curiosity, but not appear so challenging as to induce anxiety. Instruction at Mount Royal is also informed by Chickering's seven principles for good practice in undergraduate education, particularly in the emphasis of active learning, time-on-task, communication between faculty and students, and respect for multiple learning styles. In most sessions visual learners are engaged through demonstration, auditory learners through lecture and kinesthetic learners through hands-on practice [6]. In developing the program-integrated syllabi in this case study, other critical factors were that each program has a well-defined sequence of courses and that in both chemistry and journalism, the professional requirements for information literacy are clear.

In accord with the literature on information literacy in higher education, the most significant factor in the development of Mount Royal's program-integrated IL syllabi has been the collaborative relationship between the librarians and other faculty. These relationships have been maintained, through changes in personnel on both sides, due to a well-established culture of

collaboration. Librarians are true partners in the educational process. In 1997, Mount Royal established six College- Wide Outcomes[7], one of which was 'Information Retrieval and Evaluation'. This indicated strong institutional support for IL instruction to match the individual support we receive from other faculty. The current membership of the Information Retrieval and Evaluation Outcome team includes the Chair of Journalism and the Chemistry Coordinator, both of whom have been key partners in developing the IL syllabi.

This collaborative relationship was even more critical in the evolution from course-integrated to program-integrated instruction. Partnerships with individuals had to be extended to integrating the work of departments. D'Angelo and Maid [8] noted the challenge of working in courses with multiple instructors. Orr, Appleton and Wallin [9], Grafstein [10] and Mackey and Jacobson[11] all describe the importance of working with faculty to extend IL beyond the confines of IL sessions and into the fabric of courses and programs. The need to build long-term relationships is underlined by Christensen[12] who describes the organic process of weaving IL into a discipline's curriculum as a "…slow process, often taking years if not decades to accomplish." The process as experienced at Mount Royal has proven the value of faculty-librarian partnerships; the trust, the mutual respect and the development of common values led to the success of program-integrated IL instruction.

Objectives

The underlying rationale for developing program-integrated syllabi was to deepen students' understanding of their disciplines' information resources through closer ties to curriculum and assignments. Despite significant differences in process, the development of information literacy plans for chemistry and journalism shared a common set of objectives:

- Ensure comprehensiveness – that key skills and resources identified by the department and library faculty were incorporated in the syllabi
- Build on students' prior knowledge by incorporating some repetition
- Ensure that new information is included in each class and develop variations in activities and assignments to sustain student interest
- Introduce more complex information resources to higher-level students
- Ensure IL instruction matched discipline/course curriculum, i.e. that resources would be useful in the course, not just for the library assignment

Chemistry

Setting

Chemistry as a discipline has been a long-time supporter of IL, and there are numerous current resources to assist librarians in developing programs[13-15]. The Committee on Professional Training of the American Chemical Society notes that "A student who intends to be a practicing chemist … should know how to use the chemical literature effectively and efficiently. [16]" The chemistry faculty at Mount Royal teach two high-school equivalent courses, the first two years of university chemistry courses, and a chemical engineering course for the environmental technology program. The information literacy syllabus for chemistry began in 1989, with the development of a session for one first-year chemistry class that lead students through a number of reference tools, the online catalogue and Wilson's *General Science Index*. This was later

supplemented by a similar session for students in a high-school equivalent course. While the sessions were course integrated and introduced students to a broad range of resources, many of the chemistry-specific tools were too advanced for first-year students, and there was no follow-up IL instruction in senior courses where more complex resources would be more appropriate.

Methods

In 2001 instruction librarians and chemistry faculty met to plan an expansion of IL into more chemistry courses. The firm, shared belief that chemists should know how to find out if what they were working with could kill them provided the basis for a rich discussion. Librarians and chemists established key skills and sources, developed ideas for assignments and a plan matching elements of the IL syllabus with each course's curriculum. The librarians extended excellent relations with two chemistry faculty, the Chemistry Coordinator and the senior lab instructor, to include the entire department, achieving much wider understanding of the importance of information literacy to chemists. In discussing course curriculum with each other, chemistry instructors developed a greater awareness of their expectations of students' knowledge at each stage of the chemistry program and were able to effectively map IL content to students' developing knowledge of chemistry. The chemistry faculty also saw the IL sessions as a way to connect chemistry in the laboratory with chemistry in daily life, which informed the development of several of the assignments.

This fruitful meeting and the discussion with individual faculty that followed resulted in expanding the IL syllabus for chemistry from 2 courses to 7, stretching from a junior high-school equivalency course to a chemical engineering course for the environmental technology program. This led to a considerable increase in the resources and skills incorporated into the chemistry IL syllabus and a commensurate increase in demands on the library. The chemistry librarian was responsible for developing the syllabus, activities and assignments, teaching all senior courses and maintaining the program through liaison with the chemistry department (because each chemistry courses has several sections, all instruction librarians teach in the high school equivalency and first year courses).

A complicating factor in developing the program was the recognition that each of CHEM 0115, CHEM 0130 and CHEM 2201 might be the last chemistry course a student took, as these were pre-requisites for other science specialties. The group decided to keep the content of these sessions and assignments relatively general and transferable and to focus on chemistry-specific resources from CHEM 2203 onward. Also, as most students in CHEM 2201 have not previously taken CHEM 0115 or 0130 at the College, reducing duplication between those sessions was not a major factor in developing the syllabus. Students in CHEM 3357, the engineering course, typically have no prior library instruction in chemistry and require significant instruction in the use of many resources to accomplish the major course project.

The preliminary syllabus that arose from the meeting described what each course would include. Students would be expected to demonstrate an increasing familiarity with information resources as they progressed through the program, not only in their library assignments, but also in their lab reports, and would be graded accordingly. The appendix at the end of this chapter includes the current IL syllabus for chemistry, and examples of the assignments and handouts can be found on the author's webpage at http://www2.mtroyal.ca/~mmacmillan/pubs/pisal/index.htm.

The nature of the chemistry program at Mount Royal and that of the information needs and resources of the discipline have combined to make the chemistry IL syllabus remarkably stable. As students do not pursue significant chemical research in their first two years, the emphasis has been on developing their familiarity with key print and electronic chemistry reference resources, and their skills in researching various environmental, social, medical and industrial aspects of chemistry using the catalogue, general news and journal databases (e.g. ProQuest Research Library, Wilson OmniFile), and the Internet. IL sessions and course assignments also incorporate evaluation of sources, and correct citation and documentation of information.

Although there have been some changes in the past 10 years, the IL assignments and activities continue to serve the students well. In 2002, faculty requested that basic patent searching be added to the senior courses, to reflect the growing recognition of the importance of patent literature. In December 2005, the chemistry faculty met again with the chemistry librarian to check on the status of the IL syllabus. The meeting provided an opportunity for the faculty to discuss other broad curricular goals, and the only significant change to the IL program requested was a greater emphasis on citation and documentation.

The exception to the stability of the syllabus has been Chemistry 2201, the introductory credit course. This has seen several changes in lead instructor and corresponding changes to the activities and assignments. The large number of sections of this course, taught by several different lab instructors is a separate challenge to maintaining a consistent level of support for the library sessions. Librarians wishing to implement program-integrated instruction will need to maintain close ties with individual instructors to ensure the continued viability and usefulness of the IL sessions, and with the department as a whole to monitor and adjust the syllabus to accommodate changes in curriculum.

Results

While there is no formal review of the chemistry IL syllabus, the recent meeting with instructors demonstrates that it continues to serve the needs of the department and to meet the objectives outlined above. Of all of those objectives, the one that students most appreciate is that each class in the core program (2201, 2203, 3350 and 3351) is significantly different in content, assignment and activities. Students have remarked that they benefit from the brief review, but always learn something new from the library sessions. In 2005, students in second-year courses were asked to fill out an I-SKILLS Résumé[17] before a library session. A review of what they included as skills showed considerable retention of knowledge from previous classes.

Journalism

Setting

The development of the IL syllabus for journalism has taken quite a different path, reflecting both the rapid change in information skills required by the profession, and major expansion of the journalism department. In contrast to the stability of the chemistry department's courses, much of the journalism curriculum remains under development and the content and sequence of courses is still evolving to meet changing needs in the profession. Like the chemistry faculty, the journalism instructors strongly support information retrieval and evaluation as key skills in their discipline; journalism students are also readily convinced of the relevance of information literacy instruction to their professional aspirations. As in chemistry, there is also strong support for IL in the professional associations; in their *Standards for Accreditation*, the Accrediting Council on

Education in Journalism and Mass Communications lists the ability to "… conduct research and evaluate information by methods appropriate to the communications professions in which they work;" as one of the Professional Values and Competencies journalism graduates should have[18] . Also similar to chemistry is the range of literature available on teaching various aspects of research to journalism students[19-22].

Methods

The IL syllabus for journalism began with one class and one very supportive instructor, and has grown to the point where there is some formal IL instruction in almost every journalism course throughout the three years of the program. A strong initial syllabus developed in 2001 lapsed as curriculum and instructors changed, but a meeting with the instructors in 2004 served to recommit everyone to integrating IL skills more thoroughly with the program. A key factor in this turning point was that the instructor who had been working most closely with the librarian, and who was a member of the Information Retrieval and Evaluation Outcome team, became Chair of the department. This enabled closer links between the department and the library, greater sharing of information and a much more active role for the librarian in developing curriculum. The librarian attended several planning meetings in the department and continues to meet frequently with individual instructors to develop new assignments and activities. The current IL syllabus for journalism is included in the appendix and interested readers can trace its development through several iterations on the author's webpage.

The overriding concern of the librarian and the department faculty has been to develop students' knowledge of both the professional and academic information environments, which includes not only the use of specific tools but also an understanding of how information is generated, used, misused, and communicated. Students in the program research and write both news stories and academic papers, and their ability to locate, evaluate, analyze and synthesize information is crucial to their success. Library assignments tend to focus on specific types of information (e.g. government, legal, theoretical, etc.) or information gathering activities (e.g. web evaluation, fact-checking, finding human sources for stories) to highlight particular skills or resources. In more senior courses, students assess their own skills for gaps and library sessions are often built around the needs they identify. Classes at all levels include discussion of broader aspects of information from the views of both consumers and producers, generally led by the journalism faculty, but often in collaboration with the librarian.

Results

The journalism IL syllabus has grown from three classes for one senior course to its current state of 12 classes for nine courses spread throughout the program. This is an indication both of the value journalism faculty place on IL and of their commitment to developing an integrated syllabus. As new instructors have joined the department they have also become active collaborators in creating relevant learning experiences. In meeting the objectives for developing program-integrated IL syllabi listed at the beginning of this case study, the librarian and journalism faculty have created a dynamic suite of instruction sessions. Journalism students are encouraged to evaluate and track their developing information skills through using the same I-SKILLS Résumé the senior chemistry students wrote, but in a much more deliberate way. Each student writes a résumé in their first semester and submits it to the librarian who returns it in second and third year for updating. These résumés allow the students to reflect on their understanding of the information environment, and provide excellent information about what

students are learning. The range and diversity of skills reported and the depth of articulation of those skills in the résumés indicate that the students are developing information literacy over the course of their program and that they value the skills and knowledge gained through the program-integrated instruction sessions.

Conclusion

The IL syllabi for chemistry and journalism both benefit from strong faculty and library support. The needs of the students in the programs, and the nature of information in the disciplines has profoundly affected the development of each program. In both disciplines there is a clear value to both academic and professional careers in learning how to locate, evaluate and use information. The single most important factor in the success of both programs is the open, collaborative partnership between the librarians and the journalism and chemistry faculty who have invested the time to plan and coordinate IL instruction with the curriculum; a process that required significant trust among the partners. Teaching is an autonomous and oddly solitary pursuit, and integrating information skills throughout a program requires that faculty open their classes to others, and negotiate space, time and power both within the department and with the librarians. Some are more comfortable with this process than others, but the leadership of the Chair of Journalism and the Coordinator of Chemistry has ensures the continued strength of collaborations with the library.

For those who wish to create program-integrated syllabi, the first step is to cultivate and maintain excellent partnerships with the teaching faculty. Tend the IL syllabus like a garden, paying constant attention to the changes in the environment, the resources, the curriculum, and most importantly in student needs. Weed and prune material relentlessly as needs change, and be alert to additions that may enrich and diversify your plan. Allow for cross-fertilization and transplanting; move ideas, activities and assignments around the plan to improve the fit with the discipline's curriculum. Accept that parts of the syllabus will change, grow, or even disappear as faculty come and go and institutional priorities shift. Most importantly, give it time. The development of program-integrated instruction requires patience, and may take years to establish. The benefits to librarians, faculty and students are worth the effort.

Students benefit from program-integrated IL instruction by developing their skills over time within the context of their curriculum, in sessions that enhance retention through some repetition, and sustain interest and motivation through innovative and diverse activities. Thorough integration with the curriculum encourages students to see their information literacy skills as integrated with their academic and professional abilities, and to value them accordingly. Spreading IL classes throughout a program allows for a greater diversity of content and learning experiences, which in turn allows the discipline faculty to diversify their research assignments. Faculty also benefit from the process of developing program-integrated IL through examining the curriculum of the courses they teach in the larger context of the department. The greatest benefits, however, accrue to the librarians. The increased involvement in curriculum planning has encouraged the development of more innovative and effective instruction sessions and delivery modes, improved collection development through greater knowledge of the discipline and facilitated richer, more rewarding relationships with both faculty and students.

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